Amendments to the Specification:

1. Page 1, before line 3, but after the title, please insert the following:

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a U.S. National Stage of International Application No. PCT/EP2004/013448, filed November 26, 2004, which claims priority of German Patent Application No. 103 55 668.0, filed November 28, 2003.

BACKGROUND OF THE INVENTION

1. Field of the Invention

2. Page 1, before line 7, please insert the following:

2. Discussion of Background Information

3. Page 2, before line 1, please insert the following:

SUMMARY OF THE INVENTION

The present invention provides an insulation material which comprises an inorganic, porous matrix which has additional pores therein and which is based on a composition which comprises a) a sol comprising nanoparticles, polycondensates and/or precursors thereof as a binder and b) one or more solid pore formers which give rise to the additional pores.

In one aspect, the insulation material may be obtainable by shaping the composition or applying the composition to a substrate and curing the composition.

In another aspect, the average pore diameter of the additional pores may be greater than the average diameter of pores of the porous matrix. For example, the average pore diameter of the additional pores may be at least 3 times larger, e.g., at least 5 times larger, than the average diameter of the pores of the porous matrix.

In another aspect, the porous matrix may comprise micropores and/or mesopores and/or the average diameter of pores of the porous matrix may be below 200 nm, e.g., below 50 nm, or below 2 nm.

In yet another aspect of the insulation material of the present invention, the additional pores may comprise macropores and/or the average diameter of the additional pores may be at least 300 nm, e.g., at least 0.5 µm.

In another aspect, the insulation material may comprise at least 10 % by volume of pores (matrix pores + additional pores), based on the total volume of the insulation material.

In a still further aspect, organic compounds or organic groups which can be burned out to produce the inorganic matrix may be present in the composition.

In another aspect, the nanoparticles may comprise at least one metal oxide, for example, at least one of SiO_2, Al_2O_3, AlOOH, Ta_2O_5, TiO_2 and ZrO_2. Preferably, the nanoparticles comprise at least SiO_2.

In another aspect of the insulation material, the composition may comprise a nanocomposite which comprises nanoparticles which have been surface-modified by an organic compound and/or a compound containing organic groups. For example, the organic components of the nanocomposite may be burned out to form the matrix.

In another aspect of the insulation material, the nanoparticles may have been surface-modified by one or more compounds selected from hydrolyzable silanes having at least one non-hydrolyzable, organic group, carboxylic acids, anhydrides, amides, amine compounds, imines, β-diketones, amino acids and proteins. For example, the nanoparticles may have been surface-modified by one or more silanes of formula (I)

$$R_nSiX_{4-n} \qquad (I)$$

where the groups X are identical or different and are hydrolyzable groups or hydroxyl groups, the radicals R are identical or different and are each alkyl, alkenyl, alkynyl, aryl, aralkyl or alkylaryl and n is 0, 1, 2 or 3. n may be greater

than 0 for at least one of the one or more silanes of formula (I) and/or the one or more silanes of formula (I) may comprise at least one silane wherein n is 1 or 2, and at least one silane of formula (II) may have additionally been employed for surface-modifying the nanoparticles:

$$SiX_4 \qquad (II)$$

where the groups X are identical or different and are hydrolyzable groups or hydroxyl groups.

In yet another aspect of the insulation material of the present invention, the composition may further comprise hydrolysis products and/or condensation products of one or more hydrolyzable compounds of glass- or ceramic-forming metals as polycondensates or precursors thereof. At least one of the one or more hydrolyzable compounds may have at least one non-hydrolyzable substituent and/or at least one of the one or more hydrolyzable compounds may be selected from compounds of Si, Al, B, Sn, Ti, Zr, Mg, V and Zn.

In another aspect of the insulation material, the binder sol may comprise polycondensates or precursors thereof and surface-modified nanoparticles.

In yet another aspect of the insulating material, the composition may comprise at least one refractory component.

In a still further aspect, the one or more solid pore formers may comprise hollow particles, which particles may comprise glass or a plastic material and/or the one or more solid pore formers may comprise at least one of a thermally decomposable and a vaporizable material such as, e.g., one or more of a metal nitrate, an organic salt, NH_4Cl, carbon black, flour, wood flour, a wax, a protein, a polysaccharide, a silicone resin and a plastic material and/or the one or more solid pore formers may comprise an intumescent agent.

In another aspect of the insulation material, the composition may further comprise an organic monomer, oligomer and/or polymer as an additive for controlling the viscosity and/or the binding strength of a molded body.

In another aspect, the insulation material may be in the form of a molded body or may be present as a coating on a substrate.

The present invention also provides an insulation material which comprises an inorganic, porous matrix having additional pores therein and which is based on a composition which comprises a) a sol comprising nanoparticles, polycondensates and/or precursors thereof as a binder and b) one or more solid pore formers which give rise to the additional pores. The average diameter of the pores of the porous matrix is below 50 nm, the average diameter of the additional pores is at least 300 nm, and the insulation material comprises at least 12 % by volume of

pores (matrix pores + additional pores), based on the total volume of the insulation material.

The present invention also provides a process for producing an insulation material comprising an inorganic, porous matrix. The process comprises shaping a composition or applying the composition to a substrate and curing the composition to form a porous matrix having therein additional pores formed by one or more solid pore formers. The composition comprises a) a sol comprising nanoparticles, polycondensates and/or precursors thereof as a binder and b) one or more solid pore formers.

In one aspect of the process, the shaped or applied composition may be heat-treated at a temperature of at least 40°C to cure the composition.

In another aspect of the process, the shaped or applied composition may be heat-treated in at least two stages having different temperatures.

In yet another aspect the composition may be heat-treated at a temperature of at least 100°C, e.g., at least 150°C, to effect intermediate curing or curing and/or the composition may be cured at a temperature of at least 300°C, e.g., at least 350°C.

The present invention also provides a method of insulating an object against heat or cold and/or of protecting the object from fire. The method comprises insulating and/or protecting the object with the insulating material of the present invention set forth above, including the various aspects thereof.

The present invention also provides a method of protecting a heat-sensitive component from heat. The method comprises encapsulating the heat-sensitive component with the insulating material of the present invention set forth above, including the various aspects thereof.

DETAILED DESCRIPTION OF THE INVENTION

4. Page 36, first line: Please replace "**Claims**" by "WHAT IS CLAIMED IS:"